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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,619	10/25/2000	Tetsuo Tsutsui	SEL 220	3946

7590 07/26/2002

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EXAMINER
COLON, GERMAN

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 07/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,619	TSUTSUI ET AL.	
	Examiner	Art Unit	
	German Colon	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "n_1" for "layer 202" on Fig. 2, as stated on page 1 line 21, and "n_2" for "layers 201 and 203" as stated on said page lines 21-22. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C.

122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Onitsuka et al. (US 6,049,167).

Regarding claim 1, Onitsuka discloses a self light-emitting device comprising an EL layer **D13** sandwiched between a transparent electrode **D15** and an opaque electrode **D11**; and an inert gas filled in a space **D40** between the transparent electrode **D15** and a cover material **D20**, wherein each of said EL layer and said transparent electrode has a film thickness (d) in which there is no occurrence of a guided light.

Referring to claim 3, Onitsuka discloses a self light-emitting device comprising an EL layer **D13** sandwiched between a transparent electrode **D15** and an opaque electrode **D11**, said EL layer having a light-emitting layer; and an inert gas filled in a space **D40** between the transparent electrode **D15** and a cover material **D20**; and a buffer layer (**D14** or **D12)** provided between said light-emitting layer **D13** and said transparent electrode **D15** or between said light-emitting layer and said opaque electrode **D11**, wherein each of said EL layer and said transparent electrode has a film thickness (d) in which there is no occurrence of a guided light (see Figs. 1 and 3).

Regarding claims 2 and 4, Onitsuka discloses an EL device wherein the thickness (d) of the EL layer and transparent electrode satisfies a formula $d \leq \lambda/(4n)$ when a light with a wavelength "λ" generated by the EL layer passes through a medium with a refractive index "n". The examiner notes that the claim does not make reference to a particular wavelength; accordingly, any wavelength can exemplify the claimed wavelength. Onitsuka discloses the EL

layer fluorescent materials, being selected from compounds such as Alq3 [n=1.7], perylene or coumarin [n=1.5 for both] (see Col. 8, lines 25-30), with an emitted green light wavelength of 520 nm (see Col. 18, lines 34-35); it further discloses the transparent electrode made of ITO [n=1.95] (see Col. 7, lines 11-12). The preferred thickness of the EL layer ranges from 5-100 nm (see Col. 7, line 63) and that of the transparent electrode ranges from 10-100 nm (see Col. 7, line 14). The disclosed thickness values satisfy the claimed thickness equation (where $d \leq 76$ nm for Alq3 or ≤ 87 nm for perylene or coumarin and $d \leq 67$ nm for ITO).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strite (US 6,023,073) in view of Onitsuka et al. (US 6,049,167).

Regarding claim 5, Strite discloses a self-emitting device having a pixel portion comprising a semiconductor device **101** and an EL element **105** electrically connected (see Fig. 11) to the semiconductor device formed on a substrate **108**, said EL comprising: an EL layer **105** sandwiched between a transparent electrode **103** and an opaque electrode **106**, where each of said EL layer and said transparent electrode has a film thickness (d) in which there is no occurrence of guided light. Strite fails to disclose "an inert gas filled in a space between the transparent electrode and a cover material".

However, in the same field of endeavor, Onitsuka discloses an EL device comprising an EL layer being sandwiched between a transparent electrode and an opaque electrode, where an inert gas fills a space between the transparent electrode and a cover material, with the purpose of avoiding the presence of moisture that can cause separation between the EL layer and the electrode layers or degradation of the constituent materials, generating dark spots or failing to maintain light emission (see Col. 1, lines 27-32). Therefore, it would have been obvious to anyone of ordinary skill in the art at the time the invention was made to use Onitsuka's teachings to improve the EL device of Strite, in order to avoid moisture that can cause separation of the EL and electrodes layers or degradation of the constituent materials, generating dark spots or failing to maintain light emission.

Regarding claims 6, Strite-Onitsuka discloses an EL device wherein the thickness (d) of the EL layer and transparent electrode satisfies a formula $d \leq \lambda/(4n)$ when a light with a wavelength "λ" generated by the EL layer passes through a medium with a refractive index "n". The examiner notes that the claim does not make reference to a particular wavelength; accordingly, any wavelength can exemplify the claimed wavelength. Strite-Onitsuka teaches the EL layer made of either Alq3 [n=1.7] or coumarin [n=1.5] and the transparent electrode made of ITO [n=1.95] (see Tables 1 and 3 of Strite). The preferred thickness of the EL layer ranges from 1-100 nm and that of the transparent electrode ranges from 10-300 nm. The disclosed thickness values satisfy the claimed thickness equation (where $d \leq$ 103 nm for Alq3 or $\leq$ 116 nm for coumarin and $d \leq$ 90 nm for ITO, for a wavelength in the red spectrum of 700 nm).

Referring to claim 7, Strite discloses a buffer layer (either ETL or HTL) between the EL layer **105** and the transparent electrode **103** or between the EL layer and the opaque electrode **106** (see Col. 5, lines 56-58 with Col. 9, lines 42-45; see also Col. 14, lines 56-59).

Regarding claim 9, Strite-Onitsuka discloses a self light-emitting device having a pixel portion (see Fig. 9 of Strite) comprising: a plurality of opaque electrodes **91** arranged in stripe shapes; a plurality of transparent electrodes **93** provided in stripe shapes so as to be orthogonal to the plurality of opaque electrodes **91**; an EL layer **92** provided between the plurality of opaque electrodes and the plurality of transparent electrodes; and an inert gas filled in a space between the transparent electrode and a cover material, where each of said EL layer and said transparent electrode has a film thickness (d) in which there is no occurrence of a guided light.

Referring to claim 11, Strite discloses a buffer layer between the EL layer and the transparent or opaque electrodes, described in Col. 14, lines 32-36.

Referring to claims 8,10 and 12 are rejected for the reasons stated in the rejection of claim 6 above.

Prior Art of Record

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shibata et al., in U.S. Patent No. 6,147,451, discloses an organic EL in a pixel array.

Fork et al., in U.S. Patent No. 6,160,273, discloses an organic LED-based edge emitter with a waveguide.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to German Colon whose telephone number is 703-305-5987. The examiner can normally be reached on Monday thru Friday, from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 703-305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

gc
July 22, 2002

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